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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
KOSLOW, CAROL M

ART UNIT	PAPER NUMBER
1755	9

DATE MAILED: 05/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

mk -9

Office Action Summary	Application No.	Applicant(s)	
	09/751,341	HAMPDEN-SMITH ET AL.	
	Examiner	Art Unit	
	C. Melissa Koslow	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 80-142 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 80-142 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

The drawings, filed 23 July 2001, are approved under 37 CFR 1.84. Applicants are reminded of the changes to 37 CFR 1.84 and that the Draftsman no longer needs to approve the drawings. (See 65 Fed. Reg. 54603, 9/8/00).

Since applicants did not submit a petition within two months as required by options I and II of the Notice To File Missing Parts Of Nonprovisional Applicants and by the decision dismissing the petition, only the originally filed papers present in the PTO on 29 December 2000 are part of the application. Applicants are required to renumber the pages and figures of the specification consecutively and to amend the specification to remove all reference to figures 6 and 7.

The disclosure is objected to because of the following informalities: On page 74, line 4, "Y_2Si_5:Tb" should be "Y_2SiO_5:Tb". On page 60, line 15, "CDs" should be "CdS". Applicants need to clarify if both gallium and aluminum are required or if only one of these metals is required in the disclosed $Y_3(Ga,Al)_5O_{12}$. Appropriate correction is required.

Claim 121 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim.

The limitation of this claim already appears in claim 113. Thus claim 121 does not further limit claim 113.

Claims 82-84, 87 and 97-142 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Page 54 of the specification teaches the particles have an average size of about 0.1-10 microns, preferably not greater than about 5 microns. This teaching limits the average particle size of the particles to about 0.1-10 microns, preferably about 0.1-5 microns. This teaching does not support claims 113-142 since the claimed average size range of not greater than about 5 microns includes sizes smaller than about 0.1 micron. Pages 47, 71 and 74 teach ZnS doped with Al, Au, Ag, Cl or Cu. There is no teaching in the specification of ZnS containing combinations of these dopants. Thus claims 87 and 128 are not supported by the specification. Pages 69, 71 and 72 teach the voltage ranges for cathodoluminescent devices. These pages teach CRTs have a voltage range of 20-30 kV and FEDs have a voltage range of less than about 5 kV. These teaching do not support the claimed ranges of at least about 5kV and at least about 20 kV. The claimed range of not greater than about 5 kV is also not supported since the claimed range includes about 5 kV, while the teaching of less than about 5 kV excludes about 5 kV.

Claims 89 and 134 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims are indefinite since it is unclear if both gallium and aluminum are required or if only one of these metals is required in the claimed $Y_3(Ga,Al)_5O_{12}$.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in

> section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
>
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 80, 81, 83-85, 93, 96, 104-107, 109, 111, 124, 129, 130, 135 and 136 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohno et al.

This reference teaches cathode ray tubes comprising cathodoluminescent particles. Example 3 teaches Y_2O_3:Eu particles having an average particles size of 2.4 microns and where less than 90 wt% of these particles have a particle size greater than 4.8 microns (curve 10 of fig. 8). The atomic percent of Eu in Y_2O_3:Eu of example 3 is 3.7, which falls within the scope of the claimed value "about 4". Figure 3 shows the particles produced by the taught process are substantially spherical. The taught cathode ray tubes are those used in televisions or those used in airplane cockpits, which are heads-down displays. The tubes used in televisions have an excitation source which has an excitation potential in the range of 20-30 kV. The claimed devices read upon those taught.

Claims 80, 83, 84, 89, 93, 94, 96, 104-106, 109-111, 124, 134, 136, 138 and 142 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamanoi et al.

This reference teaches CRT devices containing $Y_2Al_5O_{12}$:Tb phosphors. The parent application teaches the claimed $Y_3(Ga,Al)_5O_{12}$ need not have both aluminum and gallium present in the composition. Thus taught $Y_2Al_5O_{12}$ falls within the scope of the claimed $Y_3(Ga,Al)_5O_{12}$. Figure 2 shows these phosphors are substantially spherical and the taught particles have a uniform particle size in the range of 0.2-5 microns (table 2), which means the average size must also be in this range. Since the particles are uniform in size, the particles must have a distribution where at least 90% of the particles have a size that is less than twice the average size. The taught particles are single crystals thus the crystallite size is the same as the particle size. The taught cathode ray tubes are those used in televisions which have an excitation source which has an excitation potential in the range of 20-30 kV, those used in airplane cockpits, which are heads-down displays. And those used in projection televisions. The claimed devices read upon those taught.

Claims 81 and 135 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanoi et al.

As stated above, this reference teaches the CRT devices containing substantially spherical $Y_2Al_5O_{12}$:Tb phosphors having a uniform particle size in the range of 0.2-5 microns. The taught particle size overlaps the claimed ranges. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference suggests the claimed devices.

Claims 80, 83, 84, 93, 104, 106 and 109 are rejected under 35 U.S.C. 102(b) as being anticipated by Shidlovsky.

This reference teaches a cathode ray tube comprising an excitation source and a layer of spherical cathodoluminescent particles, having an average particle size in the range of 4-6 microns and a maximum particle size of about 7 microns (col. 2, lines 49-53). The examples test the particles at a voltage in the range of 20-25 kV, which implies this is the potential of the taught excitation source. The claimed device reads upon that taught.

Claims 81, 105, 124 and 136 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shidlovsky.

As stated above, this reference teaches a cathode ray tube comprising an excitation source and a layer of spherical cathodoluminescent particles, having an average particle size in the range of 4-6 microns and a maximum particle size of about 7 microns. The taught particle size overlaps the claimed ranges. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference suggests the claimed devices.

Claims 80, 82-89, 91-93, 95, 97, 101, 103, 104, 106, 109, 111 and 112 are rejected under 35 U.S.C. 102(e) as being anticipated by Sanjurjo et al.

This reference teaches substantially spherical and monodispersed phosphors having a uniform particle size in the range of about 0.1-10 microns (col. 4, lines 8-10, col. 10, line 67-col. 11, line 1), which means the average size must also be in this range. Since the particles are uniform in size, the particles must have a distribution where at least 90% of the particles have a

size that is less than twice the average size. The taught particles are single crystals thus the crystallite size is the same as the particle size. Table 1 teaches phosphors compositions and their uses. Thus the reference teaches substantially spherical and monodispersed phosphors having a uniform particle size in the range of about 0.1-10 microns where the composition is that of table 1. The taught uses include the use in CRTs and FEDS. Thus the reference teaches CRTs and FEDs containing the taught phosphors. The taught CRTs can be those used in televisions (col. 1, line 45) which have an excitation source which has an excitation potential in the range of 20-30 kV or computer screens, which are head-up displays. FEDs are known to have an excitation source which has an excitation potential that is less than about 5 kV and the claimed structure. Table 1 teaches CRTs comprising Y_2O_3:Eu, Y_2O_2S:Eu, Zn_2SiO_4:Mn, $Y_3(Al,Ga)_5O_{12}$:Th, YSi_2O_5:Ce and ZnS:Ag or Cu and FEDs containing Y_2O_3:Eu, $Y_3(Al,Ga)_5O_{12}$:Th, YSi_2O_5:Ce and ZnS:Ag. $Y_3(Al,Ga)_5O_{12}$:Th and YSi_2O_5:Ce are clearly incorrect since these compounds are not phosphors. One of ordinary skill in the art would known the correct formulas are $Y_3(Al,Ga)_5O_{12}$:Tb and Y_2SiO_5:Ce. The claimed devices read upon those taught.

Claims 81, 98, 99, 105, 107, 108, 113-116, 118, 120, 121, 124-130, and 133-136 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanjurjo et al.

As stated above, this reference teaches CRTs and FEDs comprising substantially spherical and monodispersed phosphors having a uniform particle size in the range of about 0.1-10 microns. The taught particle size overlaps the claimed ranges. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The

reference does not teach the amount of dopants in the taught phosphors, but one of ordinary skill in the art would know the amounts are those effective to produce cathodoluminescent. These amounts are generally 20 at% or less, which overlaps the claimed range. The reference suggests the claimed devices.

Claims 80-82, 85, 92, 97-99, 103, 113-115, 120, 121, 124, 129, 130, 135 and 136 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chadha in view of Matsuda et al.

Chadha teaches Y_2O_3 :Eu phosphors and FEDs comprising these phosphors. The amount of europium in these phosphors is 1-15 at%, which overlaps the claimed range. The examples the phosphor has an average particle size of 1.123 microns and 90% of the particles have a size less than 1.75 times the average particle size and an average particle size of 4.0238 microns and 90% of the particles have a size less than 1.81 times the average particle size. The particle size ranges and distributions fall within the claimed ranges. FEDs are known to have an excitation source which has an excitation potential that is less than about 5 kV and the claimed structure. There is no teaching in Chadha that the phosphors should be substantially spherical.

Matsuda et al teach phosphors used in display devices, such as those of Chadha, should be substantially spherical so a dense phosphor layer, free of voids, can be formed. This dense layer minimizes light scattering and improves the sharpness of the image. Accordingly, one of ordinary skill in the art would have found it obvious to spherulize the phosphor of Chadha used in the taught FEDs by the methods of Matsuda et al for the reasons in Matsuda et al. The references suggest the claimed devices.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 80-83, 85, 92, 97-99, 103, 113-115 and 120-123 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 137-141 of copending Patent Application Publication 2001/0042853. Although the conflicting claims are not identical, they are not patentably distinct from each other because the device claimed in 2001/0042853 suggests those claimed in the present application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 137-141 is directed to a FED having the claimed structure and comprising oxygen containing substantially spherical phosphors having an average particle size of not greater than about 5 microns and a distribution where at least about 90% of the particles are not larger than twice the average particle size. FEDs are known to have an excitation source which has an excitation potential that is less than about 5 kV and the phosphors used in FEDs are known to be cathodoluminescent. The preferred average particle size is about 0.3-3 microns. The particles are coated where the coating substantially encapsulates the phosphors. The FED also has a pixel layer formed from the phosphors, where the thickness is not greater than about 3 times the average particle size. The phosphor can be Y_2O_3 :Eu. The claims do not teach the amount of

europium in the taught phosphors, but one of ordinary skill in the art would know the amount is that effective to produce cathodoluminescent. This amount is generally 20 at% or less, which overlaps the claimed range.

Claims 80-82, 87, 90, 92, 97-98, 102, 103, 113 and 119-123 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 57-67 of U.S. Patent No. 6,153,123. Although the conflicting claims are not identical, they are not patentably distinct from each other because the device claimed in 6,153,123 suggests those claimed in the present application.

Claims 57-67 is directed to a FED having the claimed structure and comprising sulfur containing substantially spherical phosphors having an average particle size of not greater than about 5 microns and a distribution where at least about 90% of the particles are not larger than twice the average particle size. FEDs are known to have an excitation source which has an excitation potential that is less than about 5 kV and the phosphors used in FEDs are known to be cathodoluminescent. The preferred average particle size is about 0.3-3 microns. The particles are coated where the coating substantially encapsulates the phosphors. The FED also has a pixel layer formed from the phosphors, where the thickness is not greater than about 3 times the average particle size. The phosphor can be ZnS doped with Ag, Cl, Cu and mixtures thereof or $SrGa_2S_4$:Eu.

Claims 80-84, 86-88, 90-98, 100-106, 108-113, 116-128, 131-138, and 140-142 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-38 of U.S. Patent No. 6,168,731 in view of Yamanoi et al and Sanjurjo et al.

Claims 1-38 of U.S. Patent No. 6,168,731 teach substantially spherical cathodoluminescent phosphors having an average particle size of about 0.1-10 microns and a distribution where at least about 90% of the particles are not larger than twice the average particle size. The claimed phosphors are composed of ZnS doped with Au, Al, Ag, Cl, Cu and mixtures thereof , $SrGa_2S_4$:Eu and/or Ce, Y_2O_2S:Eu and/or Tb, Zn_2SiO_4:Mn, where the amount is 0.05-2 at% Mn and Y_2SiO_5:Ce and/or Tb. There is no teaching of the devices in which these phosphors are used. Yamanoi et al and Sanjurjo et al teach cathodoluminescent phosphors are conventionally used in CRTs for projection televisions, CRTs for televisions, heads-down displays, heads-up displays, and FEDs. FEDs are known to have an excitation source which has an excitation potential that is less than about 5 kV and the claimed structure and CRTs for televisions are known to have the claimed structure and an excitation source which has an excitation potential in the range of 20-30 kV. Accordingly, one of ordinary skill in the art would have found it obvious to use the claimed phosphors of U.S. Patent No. 6,168,731 in any of the taught cathodoluminescent devices. The claims do not teach the amount of Ce and Tb in the yttrium silicate phosphors, but one of ordinary skill in the art would know the amount is that effective to produce cathodoluminescent. This amount is generally 20 at% or less, which overlaps the claimed range.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (703) 308-3817. The examiner can normally be reached on Monday-Thursday from 7:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell, can be reached at (703) 308-3823.

The fax number for Amendments filed under 37 CFR 1.116 or After Final communications is (703) 872-9311. The fax number for all other official communications is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661 or (703) 308-0662.

cmk
May 14, 2002

C. Melissa Koslow
Primary Examiner
Tech. Center 1700